

FIG. 1

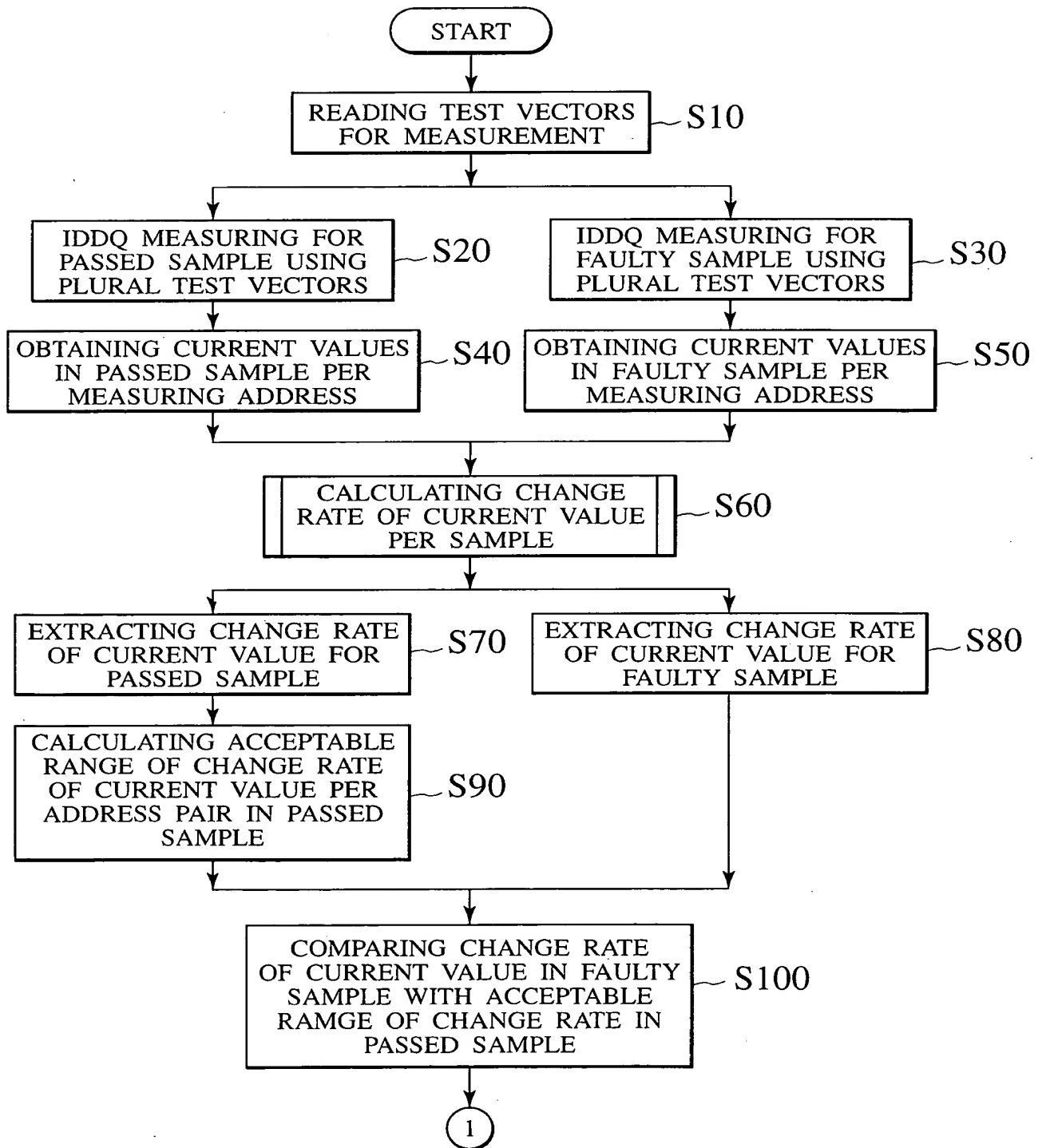


FIG. 2

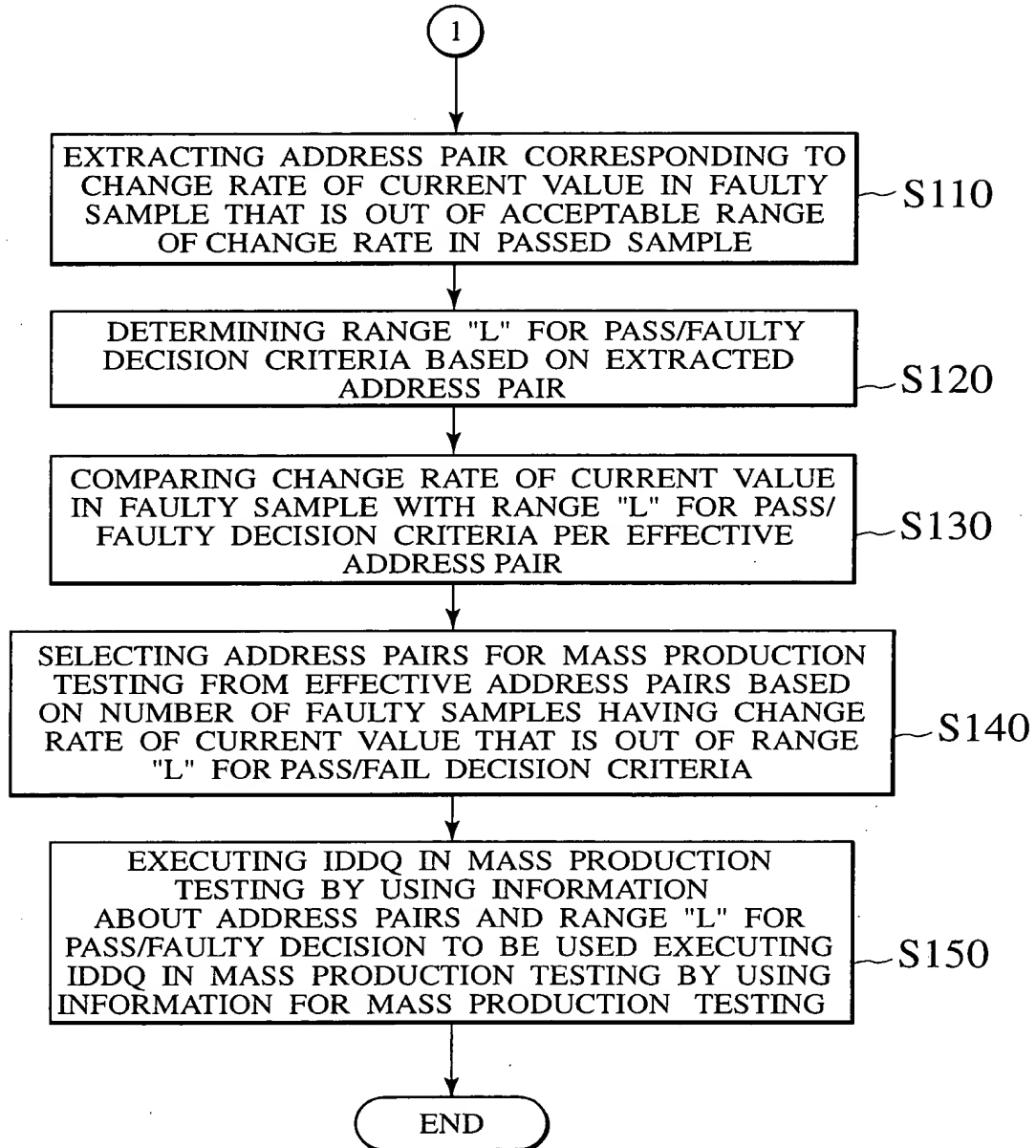


FIG. 3A

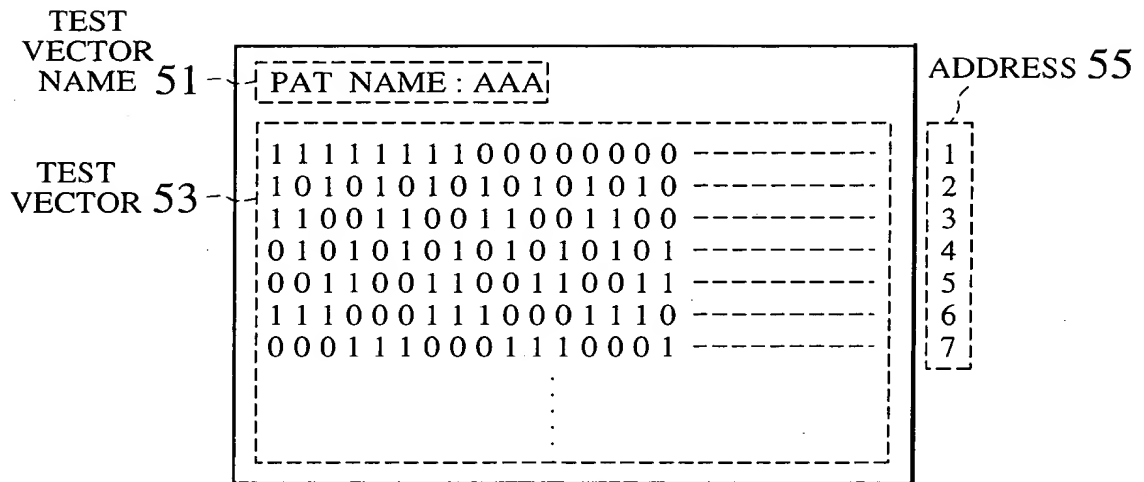


FIG. 3B

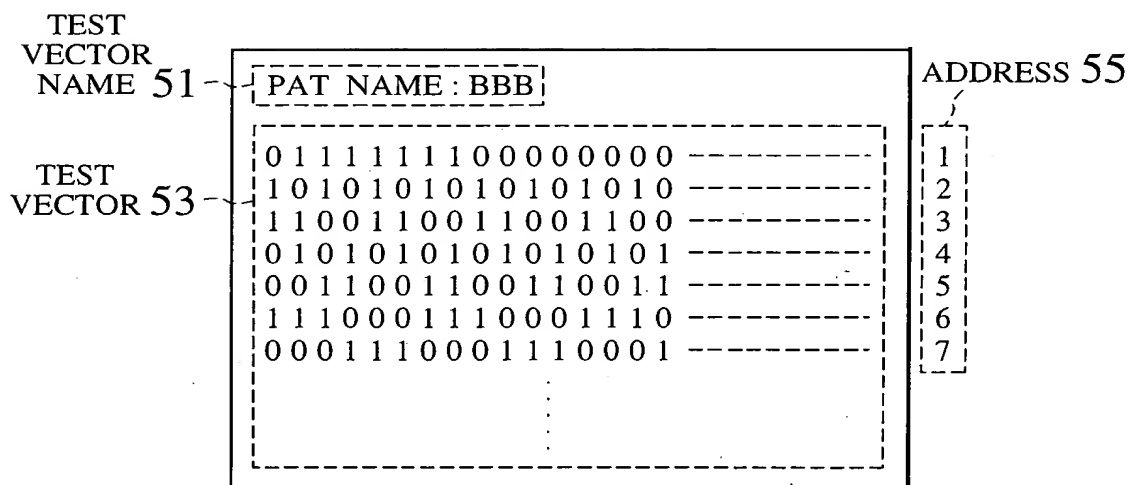


FIG. 4

PASSED SAMPLE PA

PAT=AAA	ADR=21	IDDQ=1uA
	ADR=43	IDDQ=3uA
	ADR=65	IDDQ=5uA
	ADR=87	IDDQ=1uA
	ADR=109	IDDQ=1uA
	ADR=111	IDDQ=1uA
	ADR=113	IDDQ=1uA
PAT=BBB	ADR=17	IDDQ=1uA
	ADR=19	IDDQ=1uA
	ADR=21	IDDQ=1uA
	ADR=24	IDDQ=1uA
	ADR=26	IDDQ=1uA
	ADR=28	IDDQ=1uA
	ADR=30	IDDQ=1uA
PAT=CCC	ADR=33	IDDQ=2uA
	ADR=36	IDDQ=1uA
	ADR=37	IDDQ=5uA
	ADR=49	IDDQ=1uA

PASSED SAMPLE PB

PAT=AAA	ADR=21	IDDQ=2uA
	ADR=43	IDDQ=7uA
	ADR=65	IDDQ=10uA
	ADR=87	IDDQ=2uA
	ADR=109	IDDQ=2uA
	ADR=111	IDDQ=2uA
	ADR=113	IDDQ=2uA
PAT=BBB	ADR=17	IDDQ=2uA
	ADR=19	IDDQ=2uA
	ADR=21	IDDQ=2uA
	ADR=24	IDDQ=2uA
	ADR=26	IDDQ=2uA
	ADR=28	IDDQ=2uA
	ADR=30	IDDQ=2uA
PAT=CCC	ADR=33	IDDQ=5uA
	ADR=36	IDDQ=2uA
	ADR=37	IDDQ=7uA
	ADR=49	IDDQ=2uA

PASSED SAMPLE PC

PAT=AAA	ADR=21	IDDQ=6uA
	ADR=43	IDDQ=10uA
	ADR=65	IDDQ=15uA
	ADR=87	IDDQ=6uA
	ADR=109	IDDQ=6uA
	ADR=111	IDDQ=6uA
	ADR=113	IDDQ=6uA
PAT=BBB	ADR=17	IDDQ=6uA
	ADR=19	IDDQ=6uA
	ADR=21	IDDQ=6uA
	ADR=24	IDDQ=6uA
	ADR=26	IDDQ=6uA
	ADR=28	IDDQ=6uA
	ADR=30	IDDQ=6uA
PAT=CCC	ADR=33	IDDQ=6uA
	ADR=36	IDDQ=10uA
	ADR=37	IDDQ=15uA
	ADR=49	IDDQ=6uA

FIG. 5

FAULTY SAMPLE FA	FAULTY SAMPLE FB	FAULTY SAMPLE FC
PAT=AAA ADR=21 IDDDQ=2uA	PAT=AAA ADR=21 IDDDQ=1uA	PAT=AAA ADR=21 IDDDQ=14.72uA
ADR=43 IDDDQ=3uA	ADR=43 IDDDQ=4uA	ADR=43 IDDDQ=15.20uA
ADR=65 IDDDQ=10uA	ADR=65 IDDDQ=30uA	ADR=65 IDDDQ=15.80uA
ADR=87 IDDDQ=2uA	ADR=87 IDDDQ=1uA	ADR=87 IDDDQ=14.00uA
ADR=109 IDDDQ=5uA	ADR=109 IDDDQ=1uA	ADR=109 IDDDQ=17.08uA
ADR=111 IDDDQ=5uA	ADR=111 IDDDQ=1uA	ADR=111 IDDDQ=15.82uA
ADR=113 IDDDQ=2uA	ADR=113 IDDDQ=1uA	ADR=113 IDDDQ=15.26uA
PAT=BBB ADR=17 IDDDQ=2uA	PAT=BBB ADR=17 IDDDQ=1uA	PAT=BBB ADR=17 IDDDQ=17.80uA
ADR=19 IDDDQ=2uA	ADR=19 IDDDQ=5uA	ADR=19 IDDDQ=17.82uA
ADR=21 IDDDQ=5uA	ADR=21 IDDDQ=1uA	ADR=21 IDDDQ=15.24uA
ADR=24 IDDDQ=5uA	ADR=24 IDDDQ=1uA	ADR=24 IDDDQ=15.94uA
ADR=26 IDDDQ=5uA	ADR=26 IDDDQ=1uA	ADR=26 IDDDQ=16.54uA
ADR=28 IDDDQ=2uA	ADR=28 IDDDQ=1uA	ADR=28 IDDDQ=17.20uA
ADR=30 IDDDQ=2uA	ADR=30 IDDDQ=1uA	ADR=30 IDDDQ=17.20uA
PAT=CCC ADR=33 IDDDQ=3uA	PAT=CCC ADR=33 IDDDQ=3uA	PAT=CCC ADR=33 IDDDQ=17.80uA
ADR=36 IDDDQ=2uA	ADR=36 IDDDQ=1uA	ADR=36 IDDDQ=17.72uA
ADR=37 IDDDQ=5uA	ADR=37 IDDDQ=4uA	ADR=37 IDDDQ=14.62uA
ADR=49 IDDDQ=2uA	ADR=49 IDDDQ=1uA	ADR=49 IDDDQ=15.40uA

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FIG. 6A

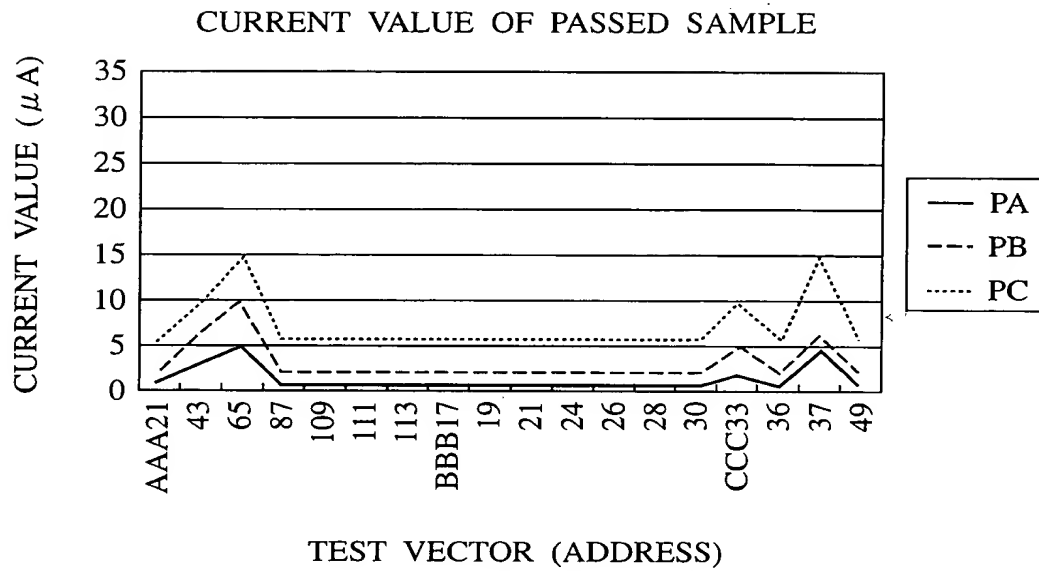
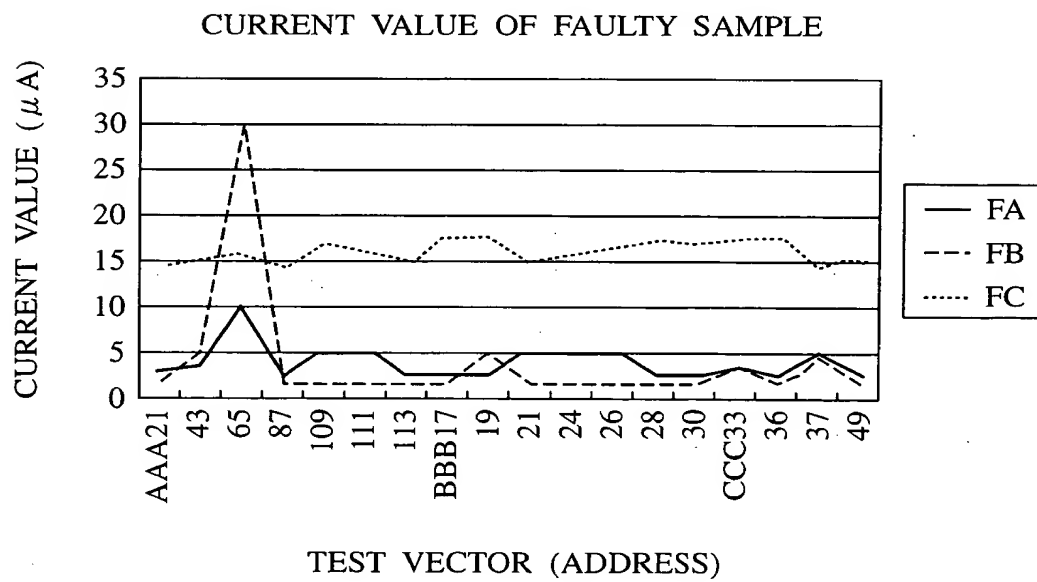


FIG. 6B



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FIG. 7

EXAMPLE OF DEFINITION FOR CHANGE
RATE "C" OF CURRENT VALUE

WHEN $b > a$

$$C = \frac{b-a}{a}$$

WHEN $a > b$

$$C = \frac{b-a}{b}$$

a: CURRENT VALUE BEFORE CHANGE

b: CURRENT VALUE AFTER CHANGE

FIG. 8

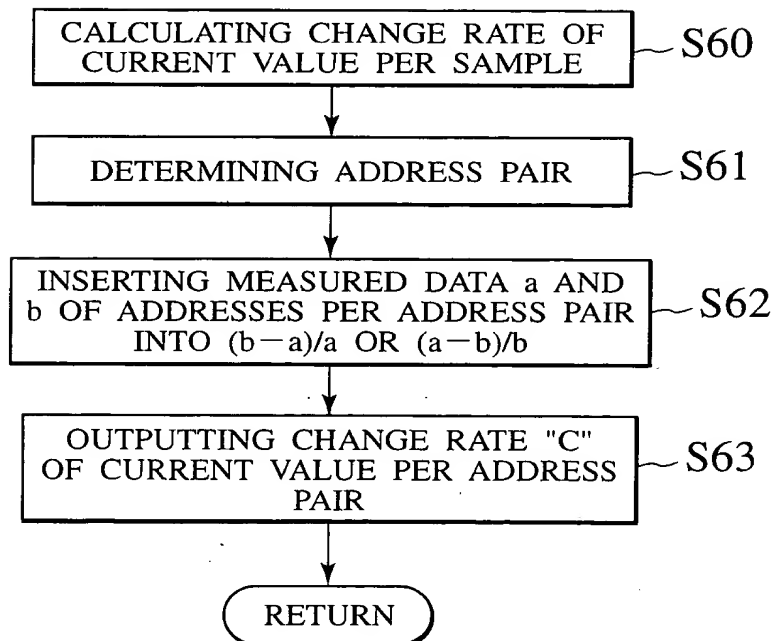


FIG. 9

ONE EXAMPLE OF CHANGE RATE OF CURRENT VALUE PER ADDRESS PAIR IN PASSED SAMPLE

COMBINATION OF CONTINUOUS TWO TEST VECTORS (ADDRESS PAIR)	CHANGE RATE			STANDARD RANGE OF CHANGE RATE OF CURRENT VALUE				
	PA	PB	PC	MIN. VALUE Cs	MAX. VALUE C1	α	Cs- α	C1+ α
PAT=AAA ADR=21,43 ADR=43,65 ADR=65,87 ADR=87,109 ADR=109,111 ADR=111,113 ADR=113,PAT=BBB ADR=17	2	2.5	0.7	0.7	2.5	0.9	-0.2	3.4
	0.7	0.4	0.5	0.4	0.7	0.15	0.25	0.85
	-4	-4	-1.5	-4	-1.5	1.25	-5.25	-0.25
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
PAT=BBB ADR=17,19 ADR=19,21 ADR=21,24 ADR=24,26 ADR=26,28 ADR=28,30 ADR=30,PAT=CCC ADR=33	1	1.5	0.7	0.7	1.5	0.4	0.3	1.9
	-1	-1.5	-0.7	-1.5	-0.7	0.4	-1.9	-0.3
	4	2.5	1.5	1.5	4	1.25	0.25	5.25
	-4	-2.5	-1.5	-4	-1.5	1.25	-5.25	-0.25
PAT=CCC ADR=33,36 ADR=36,37 ADR=37,49								

α : (MAX. VALUE - MIN. VALUE)/2

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FIG. 11

ONE EXAMPLE OF CHANGE RATE OF CURRENT VALUE PER ADDRESS PAIR IN FAULTY SAMPLE

COMBINATION OF CONTINUOUS TWO TEST VECTORS (ADDRESS PAIR)	RELATIONSHIP TO CHANGE RATE "C"/RANGE "L" OF DECISION CRITERIA ($Cs - \alpha < L < C1 + \alpha$)						RANGE "L" OF DECISION CRITERIA	
	FA	OUT OF RANGE	FB	OUT OF RANGE	FC	OUT OF RANGE	$Cs - \alpha$	$C1 + \alpha$
PAT=AAA ADR=21,43 ADR=43,65 ADR=65,87 ADR=87,109 ADR=109,111 ADR=111,113	0.5		3		0.03		-0.2	3.4
	2.3	>L	14	>L	0.04		0.25	0.85
	-4		-60	<L	-0.13		-5.25	-0.25
	1.5	>L	0		0.22	>L	0	0
	0		0		0.08	>L	0	0
	-1.5	<L	0		0.04	>L	0	0
PAT=BBB ADR=17,19 ADR=19,21 ADR=21,24 ADR=24,26 ADR=26,28 ADR=28,30	0		0		0.17	>L	0	0
	0		4	>L	0		0	0
	1.5	>L	-4	<L	-0.17	<L	0	0
	0		0		0.05	>L	0	0
	0		0		0.04	>L	0	0
	-1.5	<L	0		0.03	>L	0	0
PAT=CCC ADR=30,PAT=CCC ADR=33 ADR=33,36 ADR=36,37 ADR=37,49	0		0		0		0	0
	0.5		2	>L	0.03	<L	0.3	1.9
	-0.5		-2	<L	0		-1.9	-0.5
	1.5		3		-0.21	<L	0.25	5.25
	-1.5		-3		0.05	>L	-5.25	-0.25

Cs: MIN. VALUE, C1: MAX. VALUE, $\alpha = (C1 - Cs)/2$

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FIG. 10

CRITERIA RANGE CHANGE RATE "L"

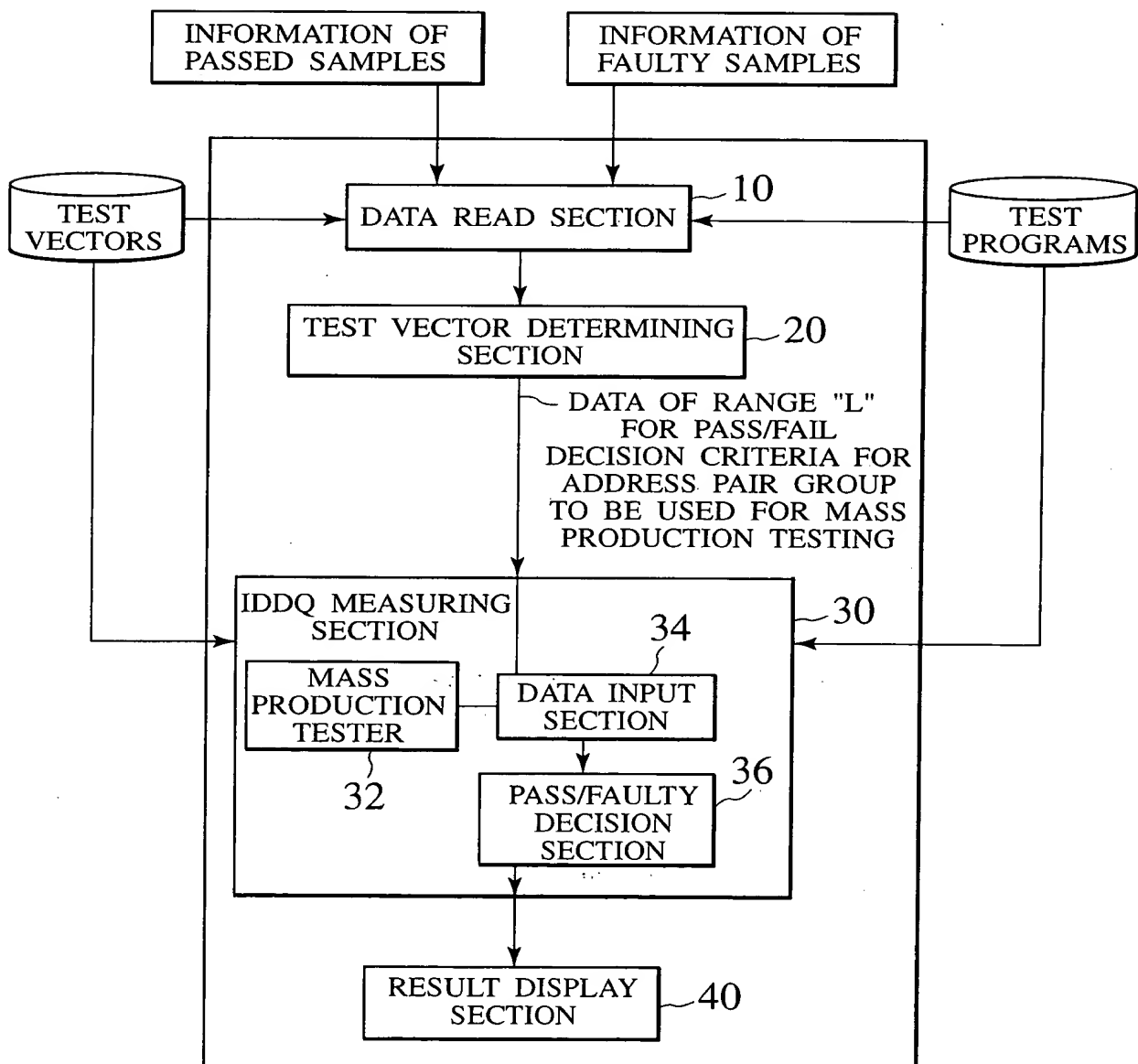
$$Cs - \alpha < L < C1 + \alpha$$

Cs: MIN. VALUE OF CHANGE RATE OF CURRENT
VALUE IN PASSED SAMPLE

C1: MAX. VALUE OF CHANGE RATE OF CURRENT
VALUE IN PASSED SAMPLE

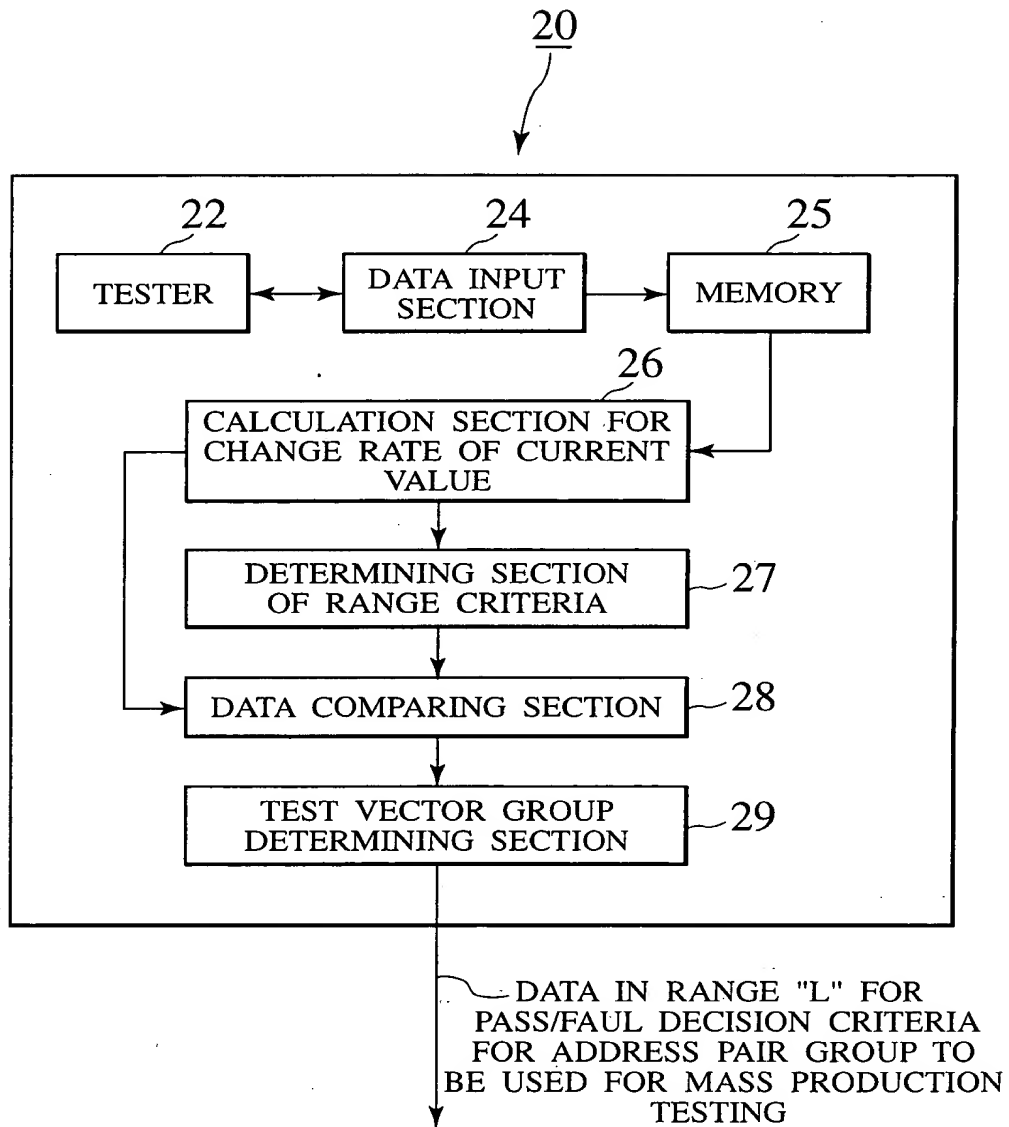
α : ERROR $(=(C1-Cs)/2)$

FIG. 12



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FIG. 13



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FIG. 14

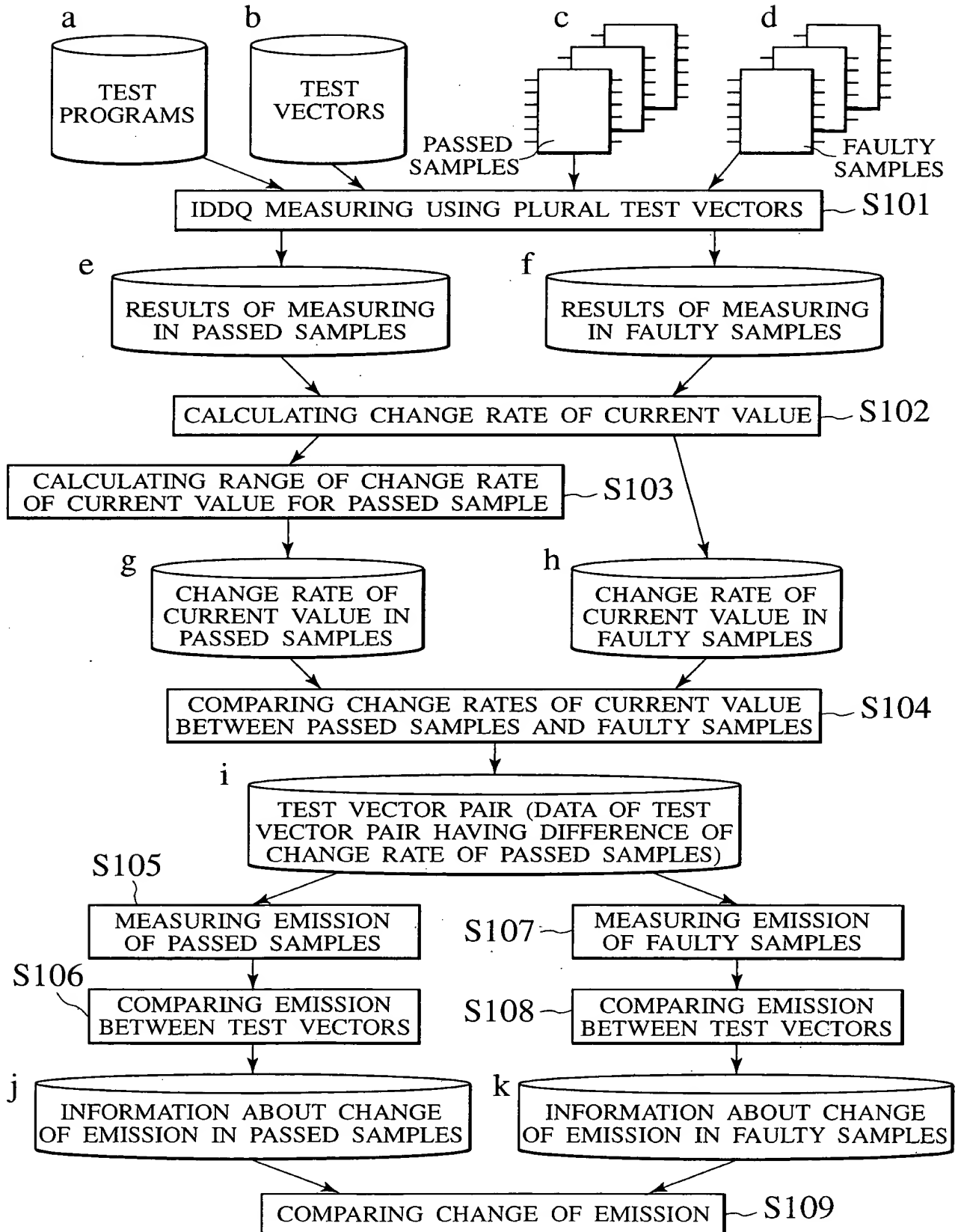


FIG. 16

PASSED SAMPLE PA

PAT=AAA	ADR=21	IDDQ=1uA
	ADR=43	IDDQ=3uA
	ADR=65	IDDQ=5uA
	ADR=87	IDDQ=1uA
	ADR=109	IDDQ=1uA
	ADR=111	IDDQ=1uA
	ADR=113	IDDQ=1uA
PAT=BBB	ADR=17	IDDQ=1uA
	ADR=19	IDDQ=1uA
	ADR=21	IDDQ=1uA
	ADR=24	IDDQ=1uA
	ADR=26	IDDQ=1uA
	ADR=28	IDDQ=1uA
	ADR=30	IDDQ=1uA
PAT=CCC	ADR=33	IDDQ=2uA
	ADR=36	IDDQ=1uA
	ADR=37	IDDQ=5uA
	ADR=49	IDDQ=1uA

PASSED SAMPLE PB

PAT=AAA	ADR=21	IDDQ=2uA
	ADR=43	IDDQ=7uA
	ADR=65	IDDQ=10uA
	ADR=87	IDDQ=2uA
	ADR=109	IDDQ=2uA
	ADR=111	IDDQ=2uA
	ADR=113	IDDQ=2uA
PAT=BBB	ADR=17	IDDQ=2uA
	ADR=19	IDDQ=2uA
	ADR=21	IDDQ=2uA
	ADR=24	IDDQ=2uA
	ADR=26	IDDQ=2uA
	ADR=28	IDDQ=2uA
	ADR=30	IDDQ=2uA
PAT=CCC	ADR=33	IDDQ=5uA
	ADR=36	IDDQ=2uA
	ADR=37	IDDQ=7uA
	ADR=49	IDDQ=2uA

PASSED SAMPLE PC

PAT=AAA	ADR=21	IDDQ=6uA
	ADR=43	IDDQ=10uA
	ADR=65	IDDQ=15uA
	ADR=87	IDDQ=6uA
	ADR=109	IDDQ=6uA
	ADR=111	IDDQ=6uA
	ADR=113	IDDQ=6uA
PAT=BBB	ADR=17	IDDQ=6uA
	ADR=19	IDDQ=6uA
	ADR=21	IDDQ=6uA
	ADR=24	IDDQ=6uA
	ADR=26	IDDQ=6uA
	ADR=28	IDDQ=6uA
	ADR=30	IDDQ=6uA
PAT=CCC	ADR=33	IDDQ=6uA
	ADR=36	IDDQ=10uA
	ADR=37	IDDQ=15uA
	ADR=49	IDDQ=6uA

FAULTY SAMPLE FA

PAT=AAA	ADR=21	IDDQ=2uA
	ADR=43	IDDQ=3uA
	ADR=65	IDDQ=10uA
	ADR=87	IDDQ=2uA
	ADR=109	IDDQ=5uA
	ADR=111	IDDQ=5uA
	ADR=113	IDDQ=2uA
PAT=BBB	ADR=17	IDDQ=2uA
	ADR=19	IDDQ=2uA
	ADR=21	IDDQ=5uA
	ADR=24	IDDQ=5uA
	ADR=26	IDDQ=5uA
	ADR=28	IDDQ=2uA
	ADR=30	IDDQ=2uA
PAT=CCC	ADR=33	IDDQ=3uA
	ADR=36	IDDQ=2uA
	ADR=37	IDDQ=5uA
	ADR=49	IDDQ=2uA

FAULTY SAMPLE FB

PAT=AAA	ADR=21	IDDQ=1uA
	ADR=43	IDDQ=4uA
	ADR=65	IDDQ=30uA
	ADR=87	IDDQ=1uA
	ADR=109	IDDQ=1uA
	ADR=111	IDDQ=1uA
	ADR=113	IDDQ=1uA
PAT=BBB	ADR=17	IDDQ=1uA
	ADR=19	IDDQ=5uA
	ADR=21	IDDQ=1uA
	ADR=24	IDDQ=1uA
	ADR=26	IDDQ=1uA
	ADR=28	IDDQ=1uA
	ADR=30	IDDQ=1uA
PAT=CCC	ADR=33	IDDQ=3uA
	ADR=36	IDDQ=1uA
	ADR=37	IDDQ=4uA
	ADR=49	IDDQ=1uA

FAULTY SAMPLE FC

PAT=AAA	ADR=21	IDDQ=14.72uA
	ADR=43	IDDQ=15.20uA
	ADR=65	IDDQ=15.80uA
	ADR=87	IDDQ=14.00uA
	ADR=109	IDDQ=17.08uA
	ADR=111	IDDQ=15.82uA
	ADR=113	IDDQ=15.26uA
PAT=BBB	ADR=17	IDDQ=17.80uA
	ADR=19	IDDQ=17.82uA
	ADR=21	IDDQ=15.24uA
	ADR=24	IDDQ=15.94uA
	ADR=26	IDDQ=16.54uA
	ADR=28	IDDQ=17.20uA
	ADR=30	IDDQ=17.20uA
PAT=CCC	ADR=33	IDDQ=17.80uA
	ADR=36	IDDQ=17.72uA
	ADR=37	IDDQ=14.62uA
	ADR=49	IDDQ=15.40uA

FIG. 17A

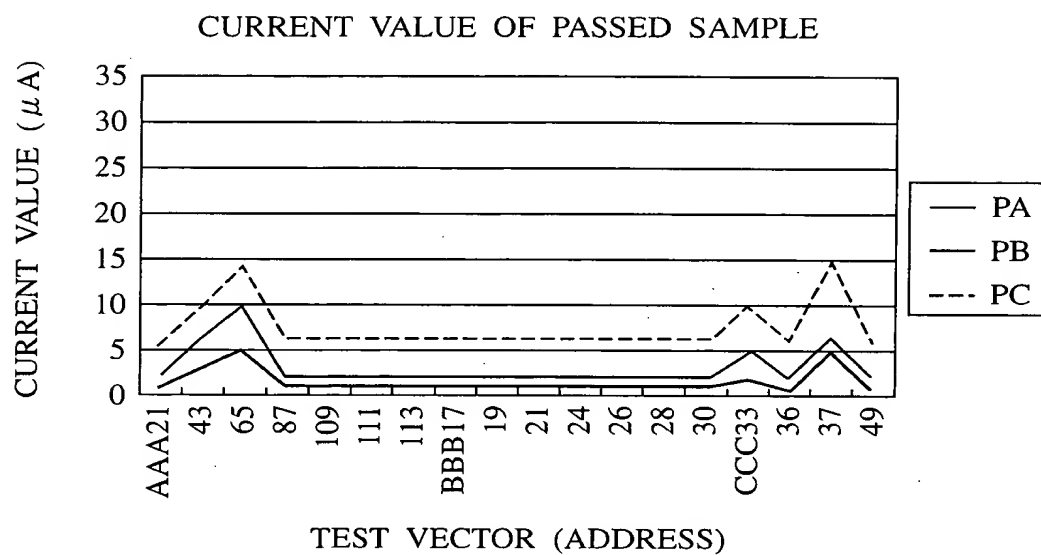


FIG. 17B

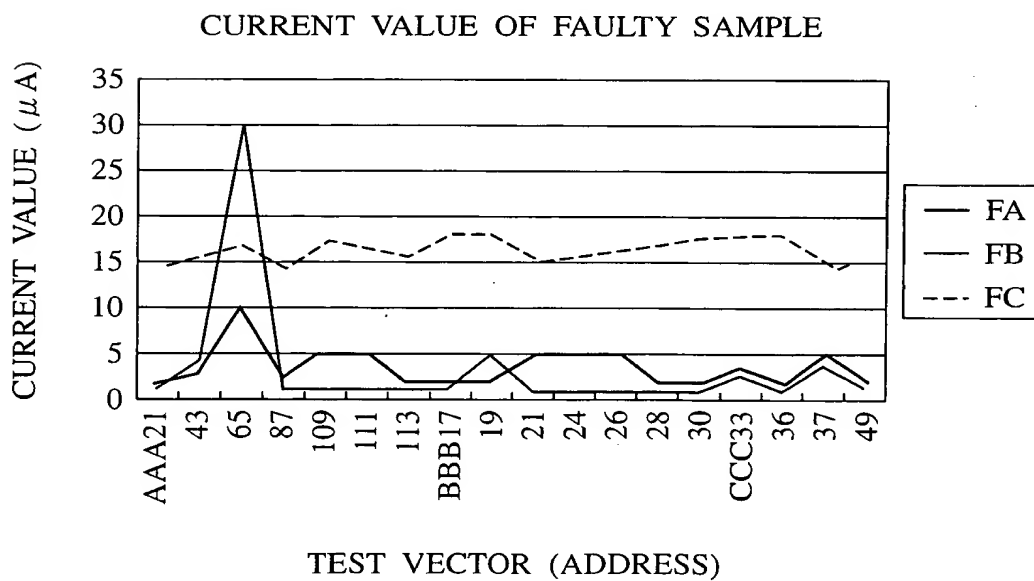


FIG. 18

WHEN CURRENT VALUE BEFORE CHANGE IS "a", AND, "b" AFTER CHANGE IN OPTIONALLY CHANGEABLE TWO MEASURING ADDRESSES THAT ARE OPTIONALLY CHANGEABLE, CHANGE RATE "C" IS DEFINED AS FOLLOWS.

WHEN $b > a$

$$C = \frac{b-a}{a}$$

WHEN $a > b$

$$C = \frac{b-a}{b}$$

WHEN MIN. VALUE IS C_s AND MAX. VALUE IS C_l IN CHANGE RATES OF PASSE SAMPLE, RANGE "L" OF CHANGE RATE OF PASSED SAMPLE IS AS FOLLOWS.

$$C_s < L < C_l$$

FIG. 19

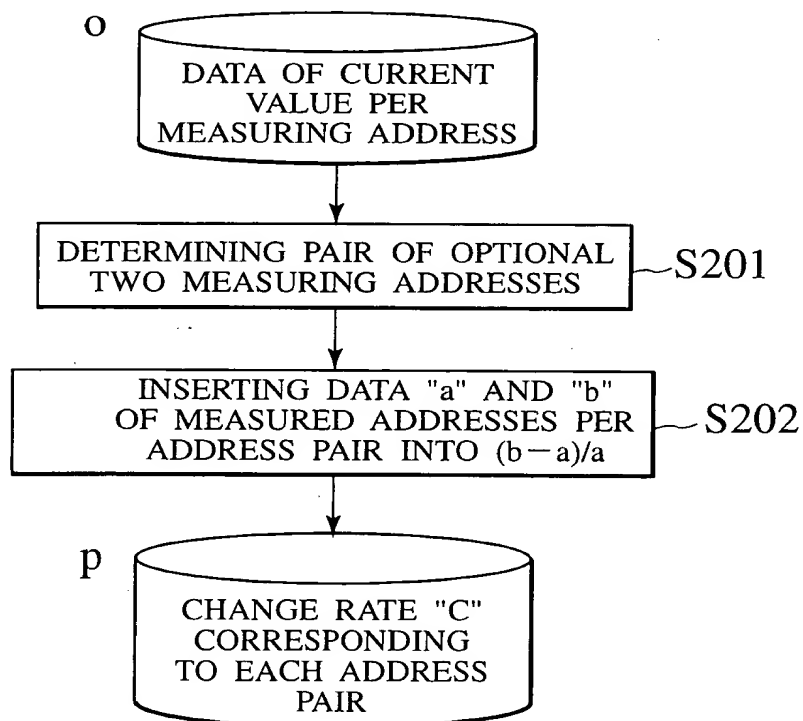


FIG. 20A

CHANGE RATE OF CURRENT VALUE PER ADDRESS PAIR IN PASSED SAMPLES

PAIR OF CONTINUOUS TWO TEST VECTORS	CHANGE RATE			RANGE OF PASSED SAMPLE	
	PA	PB	PC	MIN.	MAX.
PAT=AAA ADR=21,43 ADR=43,65 ADR=65,87 ADR=87,109 ADR=109,111 ADR=111,113	2	2.5	0.7	0.7	2.5
	0.7	0.4	0.5	0.4	0.7
	-4	-4	-1.5	-4	-1.5
	0	0	0	0	0
	0	0	0	0	0
PAT=BBB ADR=113,PAT=BBB ADR=17 ADR=17,19 ADR=19,21 ADR=21,24 ADR=24,26 ADR=26,28 ADR=28,30	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
PAT=CCC ADR=30,PAT=CCC ADR=33 ADR=33,36 ADR=36,37 ADR=37,49	1	1.5	0.7	0.7	1.5
	-1	-1.5	-0.7	-1.5	-0.7
	4	2.5	1.5	1.5	4
	-4	-2.5	-1.5	-4	-1.5

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FIG. 20B

CHANGE RATE OF CURRENT VALUE PER ADDRESS PAIR IN FAULTY SAMPLES

PAIR OF CONTINUOUS TWO TEST VECTORS	CHANGE RATE "C"/OUT OF RANGE OF PASSED SAMPLE ?						RANGE OF PASSED SAMPLE	
	FA	DIFFE- RENCE	FB	DIFFE- RENCE	FC	DIFFE- RENCE	MIN.	MAX.
PAT=AAA ADR=21,43 ADR=43,65 ADR=65,87 ADR=87,109 ADR=109,111 ADR=111,113 ADR=113,PAT=BBB ADR=17 PAT=BBB ADR=17,19 ADR=19,21 ADR=21,24 ADR=24,26 ADR=26,28 ADR=28,30 ADR=30,PAT=CCC ADR=33 PAT=CCC ADR=33,36 ADR=36,37 ADR=37,49	0.5	-0.2	3	+0.5	0.03	-0.87	0.7	2.5
	2.3	+1.8	14	+13.3	0.04	-0.38	0.4	0.7
	-4		-60	-56	-0.13	+0.37	-4	-1.5
	1.5	+1.5	0		0.22	+0.22	0	0
	0		0		0.08	+0.08	0	0
	-1.5	-1.5	0		0.04	+0.04	0	0
	0		0		0.17	+0.17	0	0
	0		4	+4	0		0	0
	1.5	+1.5	-4	-4	-0.17	-0.17	0	0
	0		0		0.05	+0.05	0	0
	0		0		0.04	+0.05	0	0
	-1.5	-1.5	0		0.03	+0.03	0	0
	0		0		0		0	0
	0.5	-0.2	2	+0.5	0.03	-0.07	0.7	1.5
	-0.5	-0.2	-2	-0.5	0	+0.7	-1.5	-0.7
	1.5		3		-0.21	-1.71	1.5	4
	-1.5		-3		0.03	+1.45	-4	-1.5

FIG. 21A

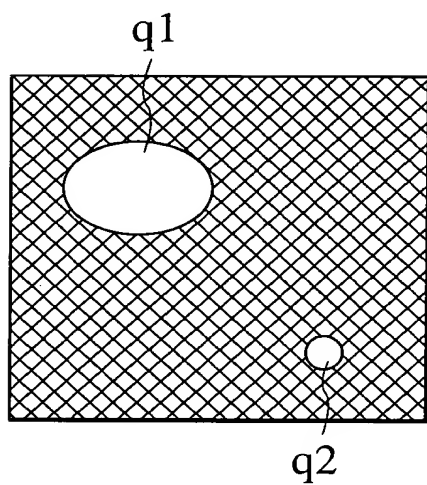


FIG. 21B

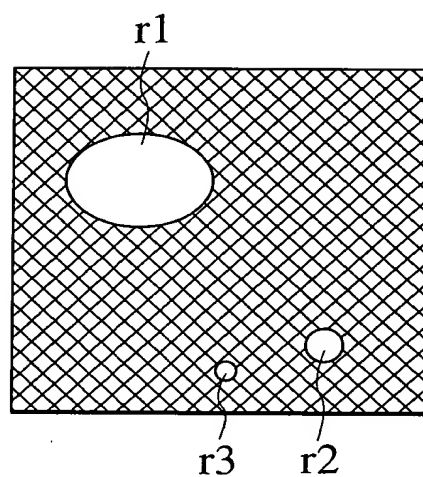


FIG. 22

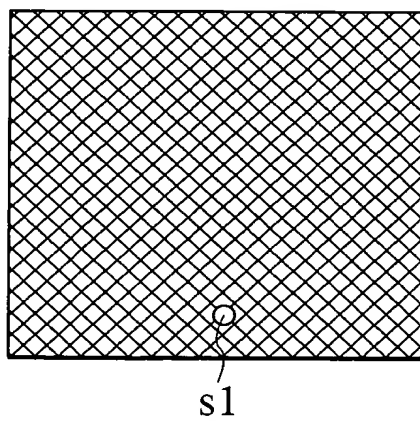


FIG. 23A

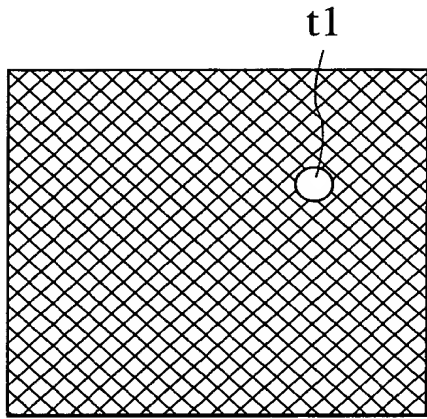


FIG. 23B

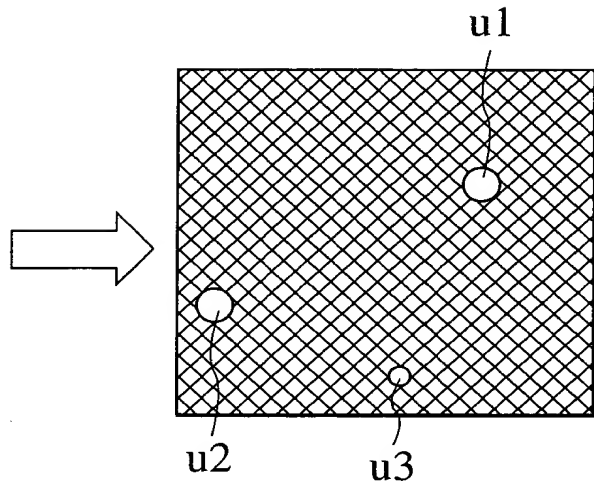


FIG. 24

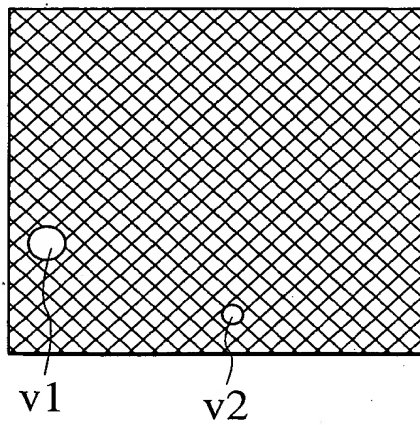
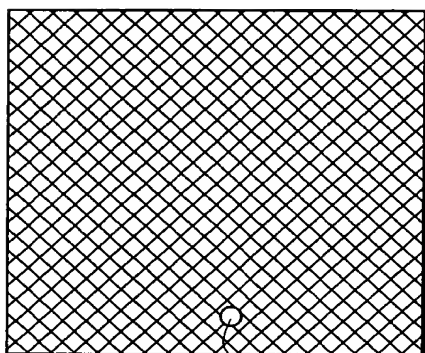
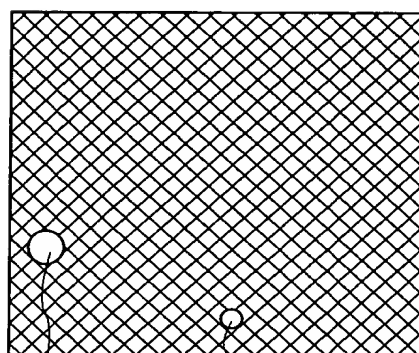


FIG. 25A



s1

FIG. 25B



v1

v2

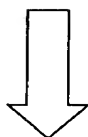
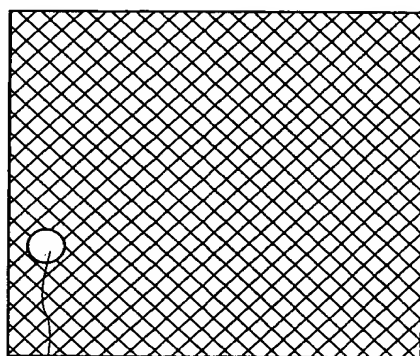


FIG. 25C



w1

FIG. 26

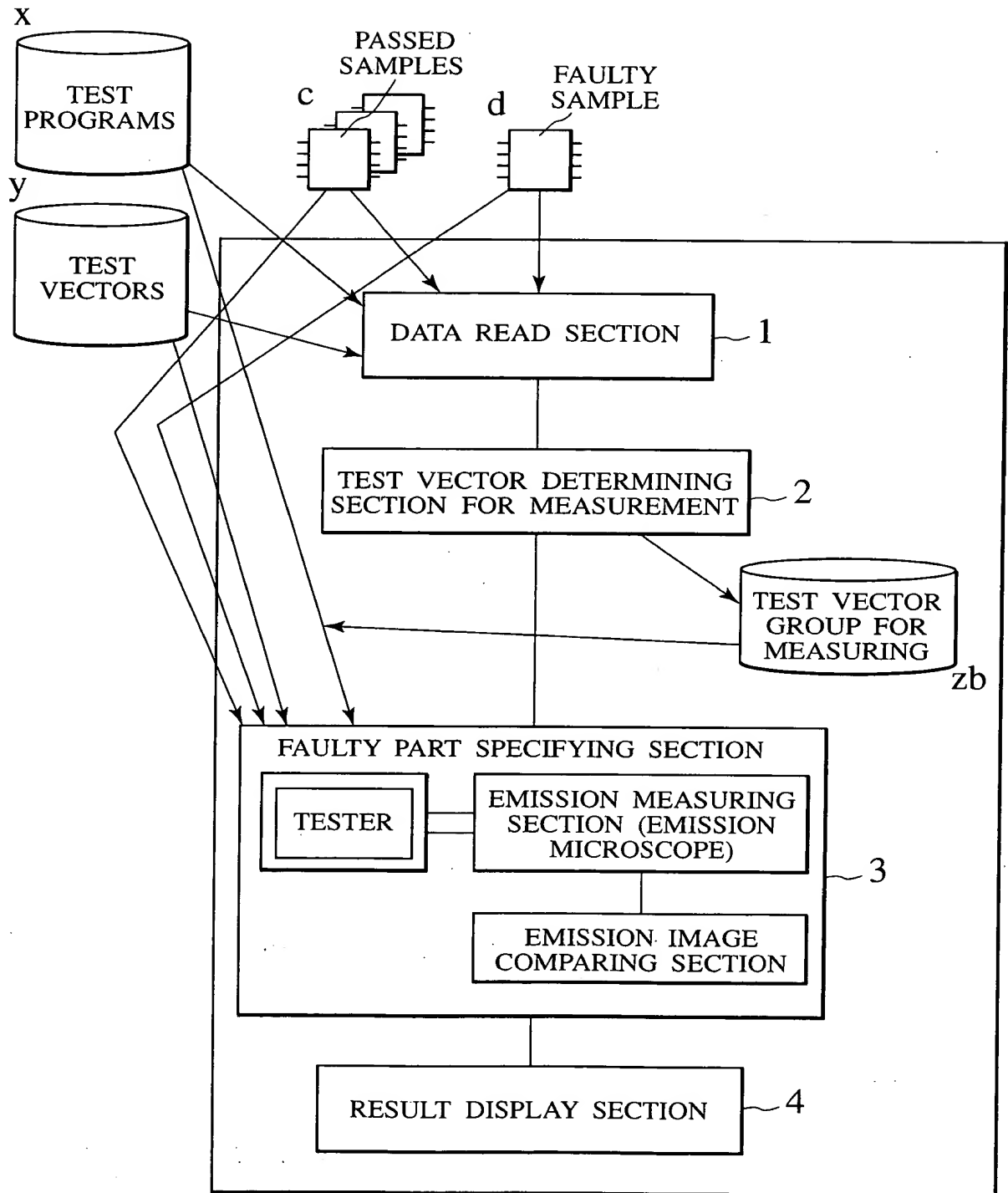


FIG. 27

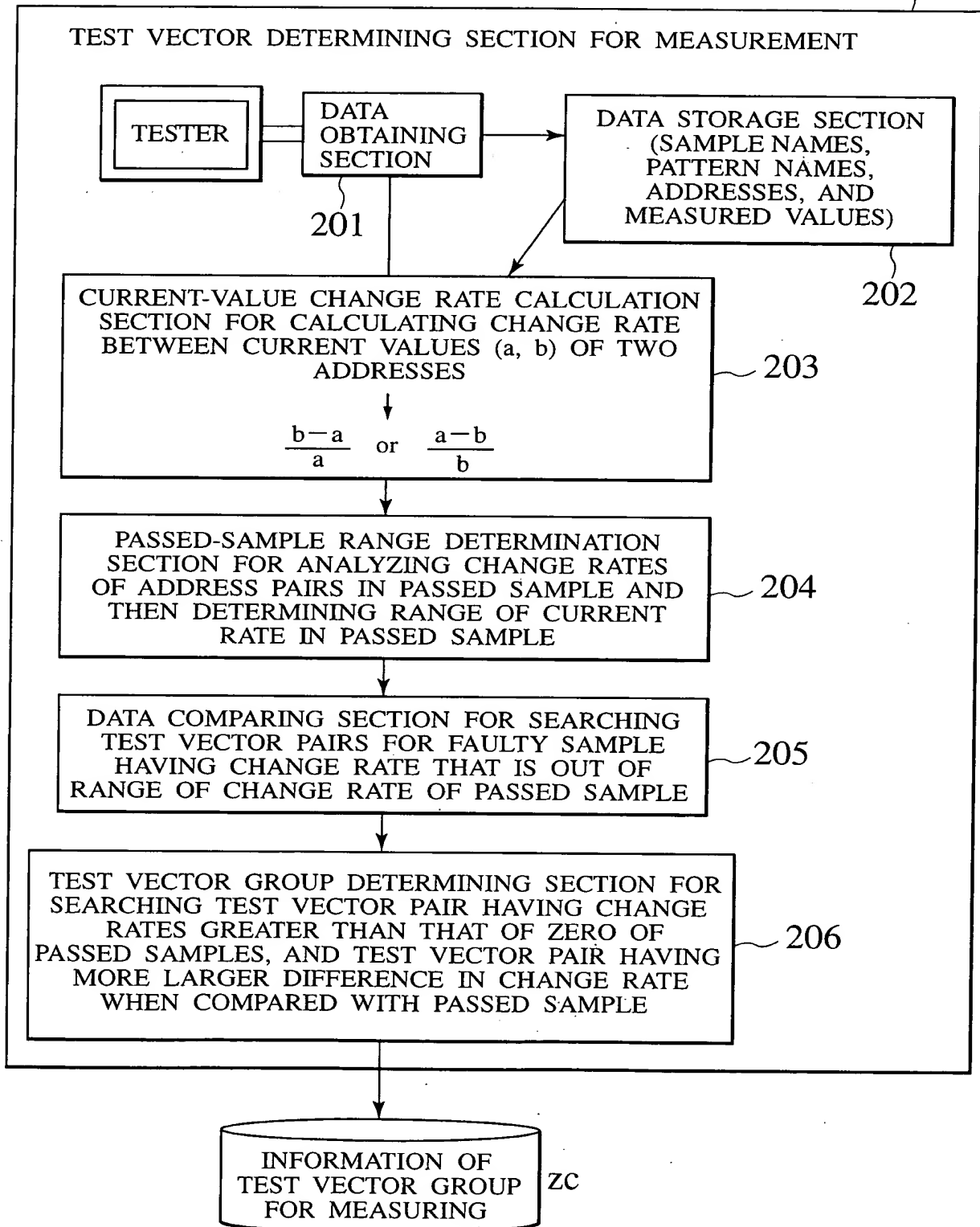


FIG. 28

